(iii) How can you explain Time & Space Complexity? Describe Asymptotic analysis of complexity bound (Best, Average & Worst Case Behaviour)

(iv) Explain Branch & Bound algorithm with suitable example.

(v) Describe about Knapsack Problem with suitable example. Find the time complexity of this problem.

(vi) What is Topological Sorting? Explain with example.

(vii) Describe about Transitive Closure with Warshall's algorithm. Give suitable example

Section – C
Descriptive Questions

3. Answer any 02 of the following questions. 2×10=20

(i) Describe briefly about Bin Packing Problem with suitable example.

(ii) Explain Cook's Theorem with suitable example

(iii) Discuss about Approximation algorithm (Vertex Cover Problem) with suitable example.

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SEMESTER END EXAMINATION MAY-2026

Course Name: - B.Tech (CSE) Semester:- 4

Paper Name: - Design & Analysis of Algorithm Paper Code:-NCS-402

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. Max Marks-70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries 3 mark. All questions are compulsory.
- Section B- Answer any 5 out of 7 given questions. Each question carries 7 marks.
- Section C- Answer any 2 out of 3 given questions. Each question carries 10 marks.

Section – A
Multiple Choice Questions

1. Answer all the following questions. 5×3=15

1) What is the Time Complexity of a Binary Search Algorithm?

(a) O (1) (b) O (n)
(c) O (log n) (d) O (n^2)

2) Which design strategy stops the execution when it find the solution otherwise starts the problem from top?

(a) Back tracking (b) Divide and conquer
(c) Branch and Bound (d) Dynamic Programming

3) The output of Kruskal and Prims algorithm is _____

(a) Maximum spanning tree (b) Spanning Tree
(c) Minimum Spanning Tree (d) None of these

4) Which of the following is true?

(a) P is a subset of NP (b) NP is a subset of P
(c) P and NP are equal (d) NP is a subset of NP hard

5) Which of the following is/are property/properties of a dynamic programming problem?

(a) Optimal substructure (b) Overlapping subproblems
(c) Greedy approach (d) Both (a) and (b)

Section – B
Short Answer Questions

2. Answer any five of the following questions. 5×7=35

(i) What do you mean by Recurrence Relation? Explain all steps to analyze a recursive algorithm.

(ii) Explain Greedy Algorithm with their application.

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